

## **Chapter 2**

### **WATER SUPPLY PLANNING PROCESS**

#### **PLANNING PROCESS COMPONENTS**

The planning process used for creation of this water supply plan can be generally divided into three broad phases: assembling background information and development of tools, issue identification and analysis, and solution development (Figure 2). Public participation was ongoing throughout the planning process, from gathering background information from local governments to holding advisory committee meetings where water supply issues and potential water supply alternatives were explored. The goals and objectives established by staff and the advisory committee provided the overall framework for the planning process.

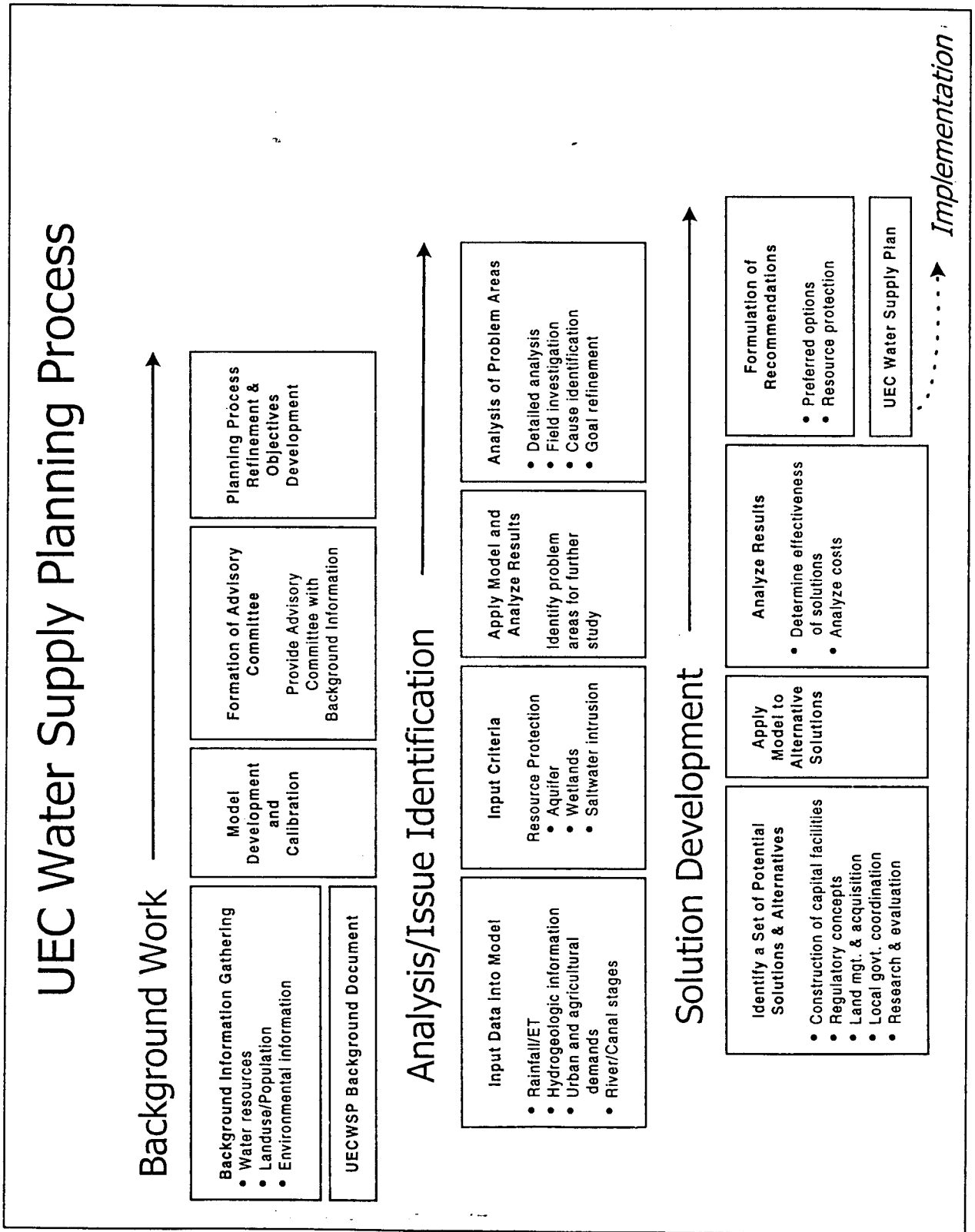
#### **Background Work**

##### **Background Information**

The District project team initially compiled extensive background information required for informed decision making later in the process. This background information included pertinent statutes and technical documents, historical information, rainfall data, land use and population information, water use demand projections, hydrogeologic and water resource information, water use permit information, details of utilities in the planning area, environmental information, and alternative water supply source concepts. The urban water use demand projections were based on population projections from local government comprehensive plans, while agricultural demand projections were based primarily on long-term historical trends. All of this information was then consolidated into a Background Document and associated appendices in October 1994 to be used by the project team and advisory committee members. As the planning process ensued, these documents were updated where new information became available. Upon completion of the UEC Water Supply Plan, the Background Document became the Support Document.

##### **Tool Development**

Another significant preparatory task was the identification, development and refinement of analytical tools needed for subsequent stages of the process. This included the development and calibration of regional ground water models for the two counties which comprise most of the planning area. Model preparation also involved the assembly of substantial amounts and types of information, including statistical analyses of rainfall events in the region, and descriptive data pertaining to aquifer characteristics such as transmissivity.



**Figure 2. Planning Process Components.**

## Advisory Committee Formation

A 30 member advisory committee, with approximately the same number of alternate members, was created to obtain public participation in the planning process. Membership included representatives of federal, state and local agencies, including planning officials; public water supply utilities; the local business community; environmental concerns; community leadership; and agricultural concerns. All committee meetings were advertised and open to the public.

The primary role of the committee, as well as the general public, was to provide input at each stage of the water supply planning process, to contribute local knowledge and the expertise of the agencies being represented, and to reflect the collective concerns and interests of various stakeholders in the Upper East Coast (UEC) Planning Area. The role of District staff was to facilitate the planning process, provide professional and technical direction, support and guidance, and prepare the planning document recognizing the committee's input.

The advisory committee spent about six monthly meetings on background presentations and sharing of information, along with development of the plan's goals and objectives (a listing of the plan goals is provided in Chapter 1). The goals established by the advisory committee served as a "road map" for the subsequent planning process. Topics scheduled for committee discussion, research and analytical work, and formulation of final recommendations all centered around these goals. Completion of the plan's initial goals marked the transition into the analytical phase of the process. The advisory committee met a total of 25 times between October 1995 and February 1998.

In addition to regular advisory committee meetings, two technical workshops were conducted to respond to questions related to the ground water modeling associated with development of the UEC Water Supply Plan. Workshop participants concluded the modeling and technical procedures used in the plan were appropriate in addressing the regional water supply picture if: (1) the results are used to address the "big picture" solutions; (2) site-specific or permit-specific solutions are not part of the plan's recommendations; and, (3) the plan focuses on development of regional water resources, not strictly regulatory solutions.

A recommendation of this plan is that the advisory committee remain in existence to help coordinate the implementation of the water supply plan with the ongoing Indian River Lagoon Restoration Feasibility Study (Goal 8) and local planning efforts. The purpose of the feasibility study is to find regional solutions to altered freshwater discharges to the Indian River Lagoon (IRL) and St. Lucie Estuary (SLE). The IRL Feasibility Study is jointly sponsored by the U.S. Army

Corps of Engineers and the South Florida Water Management District. It is scheduled to be completed in 2000.

### **Analysis and Issue Identification**

Ground water modeling was conducted to predict the impacts of projected water demands on the resource. Two sets of initial model simulation base runs were performed using identical rainfall conditions. The first set of runs represented estimated 1990 water demands, while the second represented projected water demands under the assumption that water use characteristics and management conditions in the region would remain constant. Comparisons between the two time periods, as well as the application of resource protection criteria pertaining to drawdowns under wetland systems and water levels in the Floridan aquifer, were used to identify potential problem areas. The limitations and input assumptions associated with the modeling effort are more thoroughly discussed in Chapter 4.

In the Martin Coastal and Jensen Beach Areas, where the regional model simulations indicated there were concentrated areas of potential impacts, smaller scale subregional models were used to more thoroughly examine: (1) whether potential problems were likely; and, (2) the magnitude of those problems. Input from advisory committee members and information gathered during the background research also served to identify issues to be addressed by the plan.

In addition to the ground water modeling, water availability in the major canal systems was evaluated. The availability of surface water in these canals was compared to its associated demands to determine the unmet needs. Demands that could not be met by surface water were then allocated to ground water sources, primarily the Floridan aquifer. Areas where there is potential for saltwater intrusion in 2010 were also identified.

Field investigations, research of existing technical documents, and other qualitative analytical methods were also used to analyze certain problem areas and to identify their potential causes. Additional detail on the problem areas identified and the analytical work conducted is provided in Chapter 4.

A subcommittee of the advisory committee was formed to evaluate options and develop strategies for issues associated with managing the Floridan aquifer. The subcommittee, composed of public utility and agricultural Floridan users and the USDA Natural Resources Conservation Service (NRCS), drew upon its local knowledge and experience with the Floridan aquifer to formulate water supply strategies and recommendations.

## **Solution Development**

Once potential problems were identified, a series of water source options (also referred to as water supply alternatives) were evaluated to determine their effectiveness in resolving the potential problems. Options included increased water conservation, more efficient water delivery systems, alternative water sources (e.g., reclaimed water, Floridan aquifer, surface water storage) and other approaches which would serve to maximize water resources.

Preferred options were then translated into recommendations by the advisory committee and staff. These committee recommendations were further refined into implementable strategies for the planning area. Recommendations are presented in Chapter 6.

The final product of the planning process is the UEC Water Supply Plan. The water supply plan documents the results of the planning process and provides recommendations and strategies for implementation.

## **PLAN IMPLEMENTATION**

Implementation is one of the most important phases of the UEC Water Supply Plan, in that strategies developed during the planning process are actually carried out to ensure adequate water supply through 2020. Implementation will follow approval of the plan by the SFWMD Governing Board, and will involve coordination with other agencies and planning efforts, and the strengthening of linkages between land use and water supply planning. Other components of implementation may include additional data collection, research, cost-share projects, capital construction, and rulemaking when regulatory criteria are changed. Specific plan implementation strategies are discussed in Chapter 6. After approval by the SFWMD Governing Board, water supply plans will be updated at least once every 5 years.

## **COORDINATION**

Development of the UEC Water Supply Plan was coordinated with several other planning efforts in the region, as well as with many other entities, to ensure an integrated approach and compatibility with local and regional plans. In addition, the UEC Water Supply Plan will be incorporated into the SFWMD District Water Management Plan (DWMP) which is intended to provide comprehensive long-range guidance for the actions of the water management district in implementing its responsibilities under state and federal laws.

## Related Planning Efforts

Water management planning efforts in the UEC Planning Area include a variety of interrelated studies and activities, in both the public and private sectors. Each plan or study addresses unique water management issues while maintaining close relationships with water supply planning (Table 1). These include the Indian River Lagoon (IRL) Surface Water Improvement and Management (SWIM) Plan, the IRL Restoration Feasibility Study, the Central and Southern Florida (C&SF) Comprehensive Review Study, and private sector initiatives.

The IRL SWIM Plan, initially completed in 1989 and updated in 1994, addresses water quality concerns and environmental water supply needs by providing targets for freshwater inflows to the SLE and IRL. The construction of extensive agriculture and urban drainage projects has expanded the watershed of the SLE significantly. The major effects of these man-made changes in the watershed are significant alterations in the timing (excess wet season flows, insufficient dry season flows), distribution, quality, and volume of freshwater entering the Estuary. The estuarine environment is sensitive to freshwater releases, and modification of the volume, distribution, circulation, or temporal patterns of freshwater discharges can place severe stress upon the entire ecosystem. Salinity patterns affect productivity, population distribution, community composition, predator-prey relationships, and food web structure in the in-shore marine habitat. Extreme salinity fluctuations and ever-increasing inflows have contributed to major changes in the structure of the communities within the Estuary, such as seagrass and oyster losses. In 1987, the State of Florida passed the SWIM Act, which directed the South Florida Water Management District to develop a plan to improve the water quality of the Indian River Lagoon and its tributaries, including the St. Lucie Estuary. Planning and research conducted under the direction of the SWIM program have resulted in the development of a salinity range restoration target for the Estuary.

The IRL SWIM Plan provides the basis for establishment of a minimum flow and level (MFL) for the SLE in defining the needs of the Estuary. The SLE has been designated as a priority water body by the District pursuant to Chapter 373, F.S., which requires establishment of a MFL. The District has committed to establishing a MFL for the SLE by 2001 (see Chapter 5). Establishment of MFL, including data collection, is not contingent on SWIM funding and will occur regardless of the status of the SWIM program.

**Table 1. Upper East Coast Related Water Management Planning Efforts.**

	Scope/Primary Goal	Relationship to UECWSP	Timeframes
UEC Water Supply Plan	Adequate and reliable water supply	N/A	1998
Indian River Lagoon SWIM Plan	Restoration of IRL and SLE	-Provides water quality and quantity targets for IRL and SLE	Update to be initiated in 1998
IRL Restoration Feasibility Study	Regional solutions to manage freshwater discharges to IRL and SLE and restoration of impacted watershed wetlands	-Evaluates options to meet SLE inflow range -Explore potential for supplemental water supply for agriculture -Provide detailed information needed for implementation	2001
Lake Okeechobee (L.O.) SWIM Plan	Protection and enhancement of Lake Okeechobee and its watershed (water quality)	-Backflow/inflow from C-44 Canal. -Potential C-131 backpumping if determined viable in IRL Feasibility Study.	Update completed 1997
Lake Okeechobee Regulation Schedule Environmental Impact Study	Evaluates environmental and economic impacts associated with proposed L.O. Regulation Schedules (quantity)	-Discharges from L.O. to SLE	1999
C&SF Project Restudy	Comprehensive review of environmental impacts of C&SF project	-Discharges from L.O. to SLE	1995-1999
IRL National Estuary Program Comprehensive Conservation and Mgmt. Plan	EPA program for IRL restoration	-Supports activities to enhance the IRL and SLE Creates framework for: -Identification of funding sources -Identification of lead/support partnering	1996
Lower East Coast Water Supply Plan	Adequate and reliable water supply for the Lower East Coast, for natural systems L.O. service area	-Water supply to C-44 basin -Minimum and maximum flows to SLE from L.O. -Potential C-131 if determined viable in IRL Feasibility Study	2000 Lower East Coast Interim Plan 1998

To address the freshwater discharges to the SLE, the SFWMD, in cooperation with the U.S. Army Corps of Engineers (USACE), is conducting the Indian River Lagoon Restoration Feasibility Study (Feasibility Study) to investigate regional water resource opportunities in relation to the C&SF project canal system in the UEC region. The Feasibility Study is not looking at freshwater discharges from Lake Okeechobee (these are part of the C&SF Restudy). This five-year study will develop a regional plan to address environmental restoration of areas adversely impacted by the C&SF Project system and other water supply opportunities in the region. The primary focus of the Feasibility Study is environmental restoration. This includes evaluating several alternatives, such as regional attenuation facilities (surface water storage areas), to meet the salinity envelope for the SLE, as well as enhancing surface water availability for water supply. The salinity envelope concept is discussed in greater detail in the Minimum Flows and Levels section of Chapter 5.

The IRL Restoration Feasibility Study, initiated in 1996, is a critical implementation tool for the SWIM plan, as well as this water supply plan. The IRL Feasibility Study will utilize information from the SWIM Plan to guide freshwater inflow targets and rely on the water supply plan for information about water supply deficiencies through the planning horizon.

The C&SF Project Comprehensive Review Study (Restudy) is another cooperative effort between the District and the USACE. The purpose of this study is to re-examine the C&SF Project to determine the feasibility of structural or operational modifications to the project essential to restoration of the Everglades and Florida Bay ecosystems while providing for other water-related needs such as urban and agricultural water supply and flood control. The Restudy includes all of the area of the C&SF Project with the exception of the upper St. Johns River Basin. The area encompasses approximately 18,000 square miles from Orlando to Florida Bay. Major areas include the Kissimmee River, Lake Okeechobee, St. Lucie and Caloosahatchee Estuaries, Everglades Agricultural Area, Water Conservation Areas, Upper and Lower East Coast, Lower West Coast, Everglades National Park, Big Cypress National Preserve, and Florida Bay. The Kissimmee River, Lake Okeechobee and the Everglades are the dominant watersheds that connect a mosaic of wetlands, uplands, and coastal and marine areas. The Restudy includes an evaluation of the water demands on Lake Okeechobee, including the C-44 basin, and regulatory discharges. The Restudy is scheduled to be completed in 1999.

Effective coordination among these mutually dependent studies was a priority throughout the water supply planning process (see Goal 9). Project managers from each of these plans worked together to identify opportunities to address multiple water management concerns with comprehensive solutions and to minimize duplicative efforts.



Private sector initiatives have also played a critical role in the UEC Planning Area. For example, the St. Lucie River Initiative, Inc. is a not-for-profit corporation established by concerned citizens and community leaders. The Initiative sponsors events, fund raising and community education programs which benefit the St. Lucie Estuary. Similarly, concerned citizens created the impetus for formation of the Regional Attenuation Facility (RAF) Task Force (a.k.a. the Water Preserve Area Task Force) by the Martin and St. Lucie county commissions. A RAF is a constructed facility or enhanced natural system (such as a rehydrated wetland), which stores water in order to reduce flows to an area where excessive water may cause harm (e.g., St. Lucie Estuary). Water quality improvement can also be anticipated in a RAF. The water stored in a RAF would also be used to supplement base flows to the St. Lucie Estuary during dry periods and increase surface water availability for irrigation water supply. The RAF Task Force was charged with identifying potential sites for regional attenuation facilities. In addition to the work of the task force, two charrettes (detailed public design workshops) were held to explore design issues associated with potential RAF sites in both Martin and St. Lucie counties.

Due to the potential for multiple purposes (environmental, water quality, water supply, flood control) of RAFs, there is diverse community support for creating such facilities in the planning area. Coordination with these important efforts was accomplished by including representatives from these groups in the membership of the UEC Water Supply Plan Advisory Committee, and through regular status reports on these activities.

### **Local and Regional Governments**

District staff coordinated development of the UEC Water Supply Plan with the St. Johns River Water Management District (SJRWMD), local governments, and other entities in the UEC Planning Area. The northern boundary of the planning area is the jurisdictional boundary between the SFWMD and the SJRWMD. Regular meetings were conducted between staffs from both districts to share information so that the plan accurately reflected water use activities in the SJRWMD, adjacent to the UEC region.

Significant efforts have also been made to develop stronger linkages between local government planning and the UEC Water Supply Plan (Goal 7). Regular meetings have been initiated between District staff and local land use planners and utilities to explore opportunities to link our planning efforts. These meetings have been successful in the sharing of information and understanding of related processes and requirements.

## PLANNING TIME FRAME

The planning time frame, or horizon, for the Upper East Coast Water Supply Plan is 2020. This results in a planning period of over 20 years. Plan recommendations and strategies are intended to be relevant to projected conditions for 2020.

The preparation of water demand projections for the Upper East Coast region and the development of the ground water models used for the simulation of ground water conditions began in 1992. Public water demand projections used in the ground water models were based on the 2010 projections from local comprehensive plans. The local comprehensive plans were completed in the late 1980s when this area was experiencing tremendous growth. Similarly, agricultural projections for 2010 were completed at the same time using forecasts based on historical growth, acreage and estimated future economic conditions. The model runs, using year 2010 projected demands, were completed in 1996. These results were used by District staff and the advisory committee in the development of preliminary recommendations and strategies.

In mid-1997, the Florida legislature passed new legislation pertaining to water supply plans. By this time, the advisory committee had met 18 times and the analysis and development of recommendations and strategies were substantially complete. Also, several chapters of this plan were drafted. One requirement of the new legislation is that water supply plans should have at least a 20-year planning time frame. It became apparent the 2010 demand projections would not meet the legislative requirement.

In response to this requirement, staff and the advisory committee conducted additional analysis to ensure this plan satisfied the requirement of a 20-year planning horizon. This was initiated by comparing the Plan's 2010 projections (completed in 1992) to current 2020 projections. Population projections for 2020 were obtained from the University of Florida, Bureau of Economic and Business Research (BEBR), since local comprehensive plans do not make projections to 2020. A comparison of the population projections from local comprehensive plans for 2010 to 2020 projections from BEBR indicate a difference of only 4 percent (Table 2). Based on this information, it is apparent that growth in this area has not occurred as rapidly as originally projected. BEBR projections are being used to update St. Lucie County's comprehensive plan, and Martin County's projection methodology provides similar results to BEBR.

**Table 2.** Comparison of UEC Water Supply Plan 2010 Population Projections for Martin and St. Lucie Counties to Current BEBR 2020 Projections.

County	2010 UECWSP and local government population projections <sup>1</sup>	2020 BEBR population projections <sup>2</sup>	% Difference
St. Lucie	290,100	285,700	- 2%
Martin	154,200	176,200	+ 14%
Total	444,300	461,900	+ 4%

Note: Eastern Okeechobee Co. is not included in the above figures because the population in this portion of the UEC Planning Area is small.

Sources: 1) County Comprehensive Plans.

2) Florida Population Studies, University of Florida Bureau of Economic and Business Research, Volume 30, Number 2, Bulletin 117, February 1997 (medium set).

Likewise, growth in UEC irrigated agricultural acreage (especially citrus) has slowed since 1992. The agricultural community has indicated the current 2010 projection may be realized in 2020 considering current economic conditions. Citrus represents the single greatest user of water in the UEC Planning Area.

Based on this information, the advisory committee and staff concluded that the analysis conducted for this plan has reasonably represented projected conditions for the year 2020. Therefore, the advisory committee and staff are confident that the plan recommendations and strategies apply to the year 2020 planning horizon.

The advisory committee and staff also recommend that the plan be updated in five years and that the update base all analyses on 2025 demand projections.

**This page left intentionally blank.**